CLAIMS

1. An apparatus for remote gas sensing comprising a light source, a photodetector, a gas cell containing gas or a zone through which the gas passes and through which light from the light source passes and is reflected back to the photodetector, wherein the light source, photodetector and gas cell are connected by a single polarisation preserving optical fibre through which light from the light source passes to the gas cell, which light reflected back from the cell passes back through the optical fibre with a different polarisation to that to the light transmitted by the light source.

2. An apparatus according to claim 1 further comprising means to polarise the returned light exiting the gas so that it re-enters the optical fibre polarised orthogonal to the transmitted light.

Sub A1

3. An apparatus according to either one of claims 1 and 2 further comprising means between the light source and the optical fibre arranged to split the returned light from the transmitted light and direct the returned light to the photodetector.

4. An apparatus according to any one of claims 1 to 3 wherein the light source and photodetector are positioned remotely to the gas cell or zone.

5. A method for remote gas sensing utilising a light source, a photodetector and a gas cell or zone containing gas or through which gas passes and through which light from the light source passes and is reflected back to the photodetector, including passing light from the source to the gas cell and back to the photodetector via a single polarisation preserving optical fibre such that the return light passes through the optical fibre with a different polarisation to that of the transmitted light.

6. A method according to claim 5 further comprising polarising the returned light exiting the gas so that it re-enters the optical fibre polarised orthogonal to the transmitted light.

Sub A2

7. A method according to either one of claims 5 and 6 further comprising splitting, between the light source and the optical fibre, the returned light from the transmitted light and directing the returned light to the photodetector.

8. A method according to any one of claims 5 to 7 wherein the light source and photodetector are positioned remotely to the gas cell or zone.

9. An apparatus for remote gas sensing, substantially as herein described with reference to the accompanying drawing.

10. A method for remote gas sensing, substantially as herein described with reference to the accompany drawing.